

**COTTONWOOD POINT WATER ASSOCIATION (PWSNO 1050008)  
SOURCE WATER ASSESSMENT REPORT**

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**February 24, 2003**



**State of Idaho  
Department of Environmental Quality**

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## Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the act. This risk assessment is based on a land use inventory in the well recharge zone, sensitivity factors associated with how the well was constructed, and aquifer characteristics.

This report, *Source Water Assessment for Cottonwood Point Water Association*, describes the public drinking water well; the well recharge zone and potential contaminant sites located inside the recharge zone boundaries. This assessment, taken into account with local knowledge and concerns, should be used as a planning tool to develop and implement appropriate protection measures for this public water system. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

A 300-foot deep well supplies drinking water for Cottonwood Point Water Association. The water system serves a population of about 85 people in a residential neighborhood on the north side of the St. Joe River near St. Maries, Idaho. Even with water restrictions, the system has experienced periods when the capacity of the well is unequal to the demands placed on it. Historically, Cottonwood Point Water Association has had few water quality problems. A ground water susceptibility analysis conducted by DEQ December 2, 2002 found the well to be at low risk relative to all classes of regulated contaminants.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

Cottonwood Point already has some important drinking water protections in place. The system operates and maintains the well in compliance with *Idaho Rules for Public Drinking Water Systems*. A pump house protects the wellhead from unauthorized access and from surface contaminants. The system has developed a water emergency response plan. A cross connection control resolution was established in December 2002.

The association is actively looking for a new well site. An earlier attempt to develop a second well was unsuccessful because it drew from the same limited source as the current well. Meanwhile, the system should continue to promote water conservation among the system users. A moratorium on new housing in the area may be necessary until a new water source is developed.

Due to the time involved with the movement of ground water, source water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. For assistance in developing protection strategies, please contact your regional Department of Environmental Quality office or the Idaho Rural Water Association.

# SOURCE WATER ASSESSMENT, COTTONWOOD POINT WATER ASSOCIATION

## Section 1. Introduction - Basis for Assessment

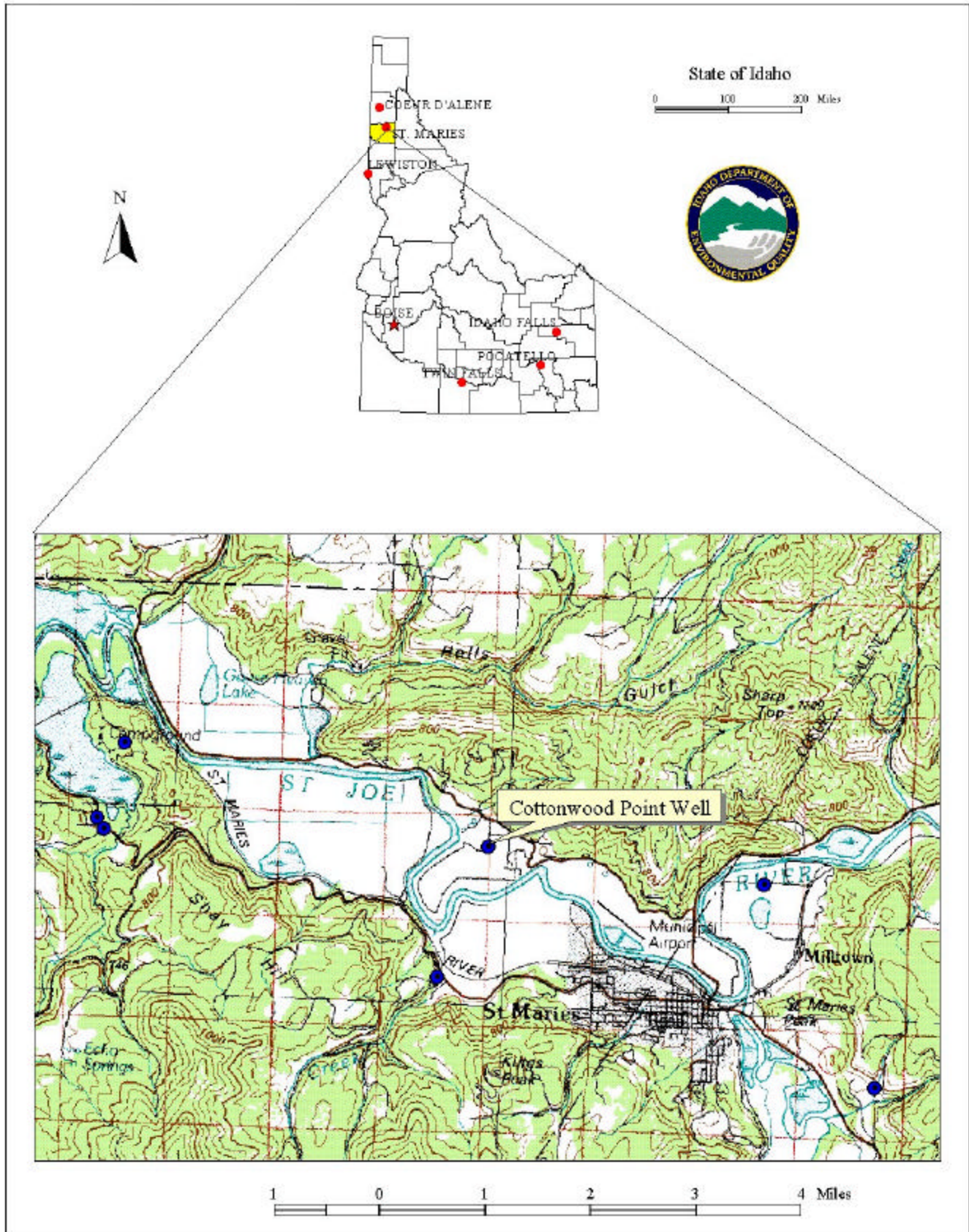
The following sections contain information necessary for understanding how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area and an inventory of significant potential sources of contamination identified within that area are included. The ground water Susceptibility Analysis Worksheet used to develop this assessment is attached.

### Level of Accuracy and Purpose of the Assessment

The Idaho Department of Environmental Quality (DEQ) is required by the U.S. Environmental Protection Agency (EPA) to assess every public drinking water source in Idaho for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. These assessments are based on a land use inventory inside the delineated recharge zones, sensitivity factors associated with how the well is constructed, and aquifer characteristics. The state must complete more than 2900 assessments by May of 2003. Because resources and the time available to accomplish assessments are limited, an in-depth, site-specific investigation for every public water system is not possible.

**The results of the source water assessment should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.** The ultimate goal of this assessment is to provide data to local communities for developing a protection strategy for their drinking water supply. The Idaho Department of Environmental Quality recognizes that pollution prevention activities generally require less time and money to implement than treating a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a source water protection program should be determined by the local community based on its own needs and limitations. Wellhead or source water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Figure 1. Geographic Location of Cottonwood Point Water Association



## **Section 2. Preparing for the Assessment**

### **Defining the Zones of Contribution - Delineation**

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the well recharge area into time of travel zones indicating the number of years necessary for a particle of water flowing through the aquifer to reach a well. DEQ used a refined computer model approved by the EPA to determine the extent of the recharge zone and to divide it into time of travel (TOT) zones. The computer model used data assimilated by DEQ from a variety of sources including the local well logs.

Cottonwood Point Water Association is a community system with 45 service connections supplying drinking water to a population of 85 people in a residential area north of the St. Joe River near St. Maries, Idaho. (Figure 1). The 300-foot deep well is located on a peninsula formed where the river meanders across the width of the river valley.

The source water assessment delineation for the Cottonwood Point Water Association well encompasses about 107 acres. The recharge zone is roughly circular with ground water flowing to the well from all directions (Figure 2).

### **Identifying Potential Sources of Contamination**

The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. Inventories for all public water systems in Idaho were conducted in two-phases. The first phase involved identifying and documenting potential contaminant sources within a system's source water assessment area through the use of computer databases and Geographic Information System maps developed by DEQ. Maps showing the delineations and tables summarizing the results of the database search were then sent to system operators for review and correction during the second or enhanced phase of the inventory process. Information from the public water system file was also incorporated into the potential contaminant inventory. Barbara Bentley reviewed the map and inventory for Cottonwood Point Water Association.

Figure 2, *Cottonwood Point Water Association Delineation and Potential Contaminant Inventory* on page 7 of this report shows the location of the Cottonwood Point Water Association well, the zone of contribution DEQ delineated for it, and any potential contaminant sites in the vicinity. Land use inside the delineation boundaries is suburban. Four homes in the area have individual septic systems. The remainder are connected to the Benewah County regional sewer system.

Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. When a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation.

### **Section 3. Susceptibility Analysis**

The susceptibility to contamination of all ground water sources in Idaho is being assessed on the following factors:

- physical integrity of the well,
- hydrologic characteristics,
- land use characteristics, and potentially significant contaminant sources
- historic water quality

The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. A high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. The following summaries describe the rationale for the susceptibility ranking. The Susceptibility Analysis Worksheet for the Cottonwood Point Water Association well, Attachment A, shows in detail how the well was scored.

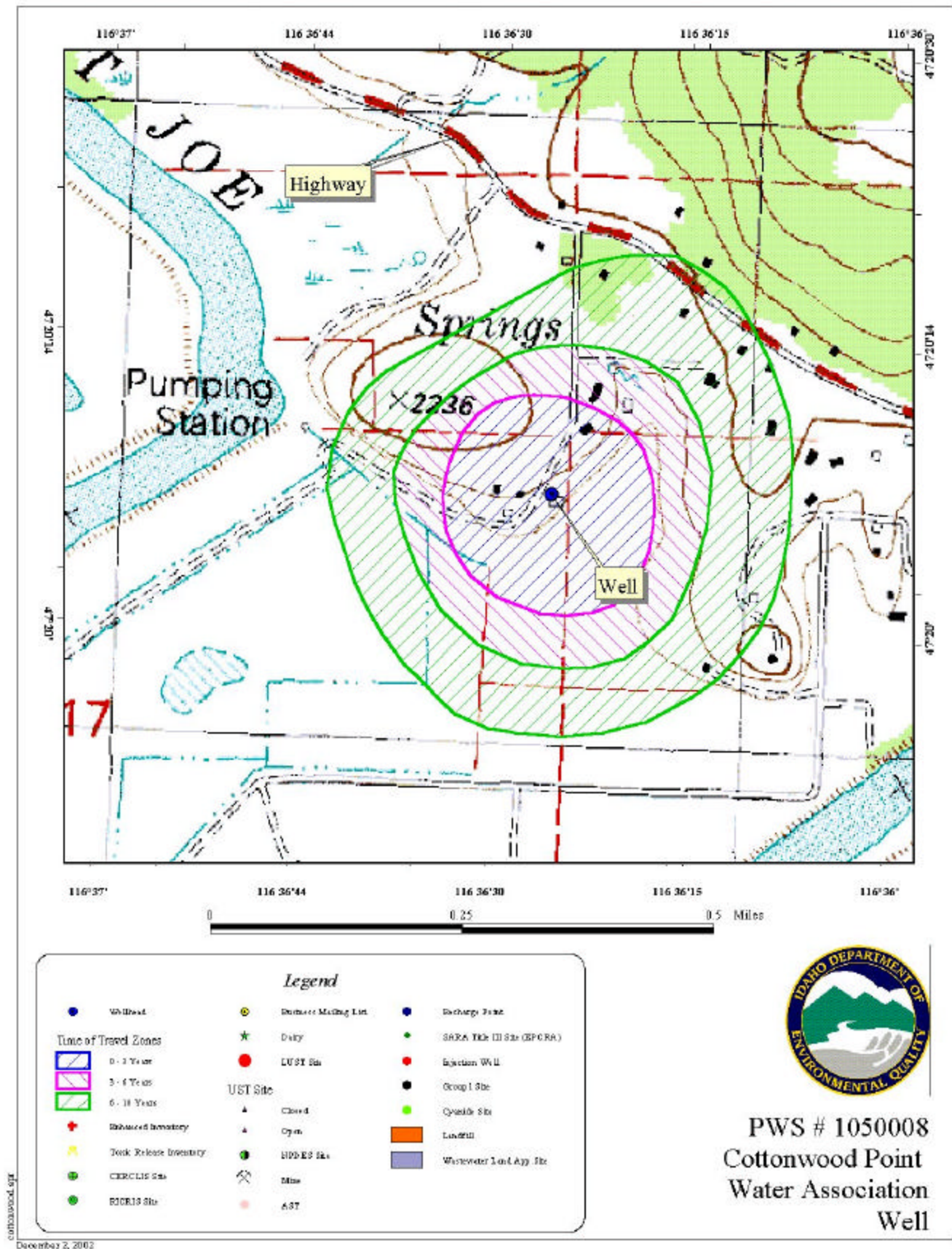
#### **Well Construction**

Well construction directly affects the ability of the wells to protect the aquifer from contaminants. Lower scores imply a well that can better protect the water. This portion of the susceptibility analysis relies on information from individual well logs and from the most recent sanitary survey of the public water system. The Cottonwood Point Water Association well log is on file with DEQ. No deficiencies in the wellhead and surface seal were noted during the sanitary survey in June 2002.

The well was drilled in 1984 to a depth of 300 feet. The 6-inch steel casing extends from a foot above ground to a depth of 203 feet where it terminates in clay. The 18-foot deep surface seal extends through a clay layer and into a layer of mixed sand and clay. The seal is partially composed of well cuttings, a practice no longer allowed under Idaho Department of Water Resources well construction standards. The static water level in the well is 80 feet below ground. The well produced about 30 gallons per minute when it was tested at the time it was drilled.



Figure 2. Cottonwood Point Water Association District Delineation and Potential Contaminant Inventory.



## **Hydrologic Sensitivity**

Hydrologic sensitivity scores reflect natural geologic conditions at the well site and in the recharge zone. Information for this part of the analysis is derived from individual well logs and from the soil drainage classification inside the delineation boundaries. The Cottonwood Point Water Association well scored 1 points out of 6 points possible in the hydrologic sensitivity portion of the susceptibility analysis.

Soils in the recharge zone generally are classed as moderately well drained to poorly drained. Soils that drain slowly are deemed more protective of ground water than quickly draining soils. When the well was drilled, ground water was first encountered at 80 feet. Clay lenses 10 to 40 feet thick lies over each of the three water-bearing strata in the well. These clay beds help protect the ground water from vertical transport of contaminants. The well is above the 100-year flood plain for the St. Joe River, and is not hydraulically connected to it.

## **Potential Contaminant Sources and Land Use**

Figure 2, *Cottonwood Point Water Association Delineation and Potential Contaminant Inventory* on page 7 shows the location of the Cottonwood Point Water Association well, and the zone of contribution DEQ delineated for it. Land use inside the delineation boundaries is suburban residential. 4 homes in the area have individual septic systems. The nearest one is about 200 feet from the well. The remaining homes in the area are connected to the regional sewer system. The public water system file for Cottonwood point mentions a second well that was abandoned when it was shown to be hydraulically connected to the current source. State Highway 3 crosses the 6-10 year time of travel zone. As a trucking route it is a potential source of all classes of regulated contaminants. No other potential sources of contamination are documented inside the well recharge zone.

## **Historic Water Quality**

Cottonwood Point Water Association has had few water quality problems. The system chlorinates its water prior to distribution, but samples of the untreated well water tested in November 2000 generated less than one colony of total coliform or E. coli per 100/ml. Disinfection by-products were detected in a sample tested in November 2001. The 2002 sanitary survey noted that the system was not using a chlorine residual test kit approved drinking water application. Chemical test results are listed on the table below.



**Table 1. Cottonwood Point Water Association Chemical Sampling Results**

Primary IOC Contaminants (Mandatory Tests)							
Contaminant	MCL (mg/l)	Results (mg/l)	Dates	Contaminant	MCL (mg/l)	Results (mg/l)	Dates
Antimony	0.006	ND	11/28/95 to 10/23/01	Nitrate	10	2.48 to 5.72	3/1/1984 to 10/23/01
Arsenic	0.01	ND	6/16/83 to 10/23/01	Nickel	N/A	ND	11/28/1995 to 10/23/2001
Barium	2	ND to 0.01	6/16/1983 to 10/23/01	Selenium	0.05	ND	3/4/95 to 10/23/01
Beryllium	0.004	ND	11/28/1995 to 10/23/2001	Sodium	N/A	10.7 to 12.3	3/4/85 to 10/23/01
Cadmium	0.005	ND	3/4/1985 to 10/23/2001	Thallium	0.002	ND	11/28/95 TO 10/23/01
Chromium	0.1	ND	6/16/1983 to 10/23/2001	Cyanide	0.02	ND	11/28/1995
Mercury	0.002	ND	3/4/85 to 10/23/01	Fluoride	4.0	ND to 0.6	3/4/1985 to 10/23/2001
Regulated and Unregulated Synthetic Organic Chemicals							
Contaminant			Results		Dates		
29 Regulated and 13 Unregulated Synthetic Organic Compounds			None Detected		9/27/1993, 10/23/01		
Regulated and Unregulated Volatile Organic Chemicals							
Contaminant			Results		Dates		
21 Regulated And 16 Unregulated Volatile Organic Compounds			None Detected		9/27/1993, 10/23/01		
Radiological Contaminants							
Contaminant		MCL	Results		Dates		
Gross Alpha, Including Ra & U		15 pC/l	3.5 to 5.9 pC/l		5/1/84 to 10/23/01		
Gross Beta Particle Activity		4 mrem/year	3.0 to 6.6mrem 5.9 pC/l		5/1/84to 10/7/97 10/23/01		

**Final Susceptibility Ranking**

The Cottonwood Point Water Association well has a low susceptibility to contamination. The complete Susceptibility Analysis Worksheet for the Cottonwood Point Water Association well can be found in Attachment A. Totals for system construction and hydrologic sensitivity along with the cumulative scores for land use and potential contaminant sources are summarized on Table 2.

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score =

Hydrologic Sensitivity + System Construction + (Potential Contaminant & Land Use x 0.2)

2) Microbial Final Score =

Hydrologic Sensitivity + System Construction + (Potential Contaminant & Land Use x 0.35)

The final ranking categories are as follows:

- 0 - 5 Low Susceptibility
- 6 - 12 Moderate Susceptibility
- > 13 High Susceptibility

**Table 2. Summary of Cottonwood Point Water Association Susceptibility Evaluation**

<b>Cumulative Susceptibility Scores</b>						
Well Name	System Construction	Hydrologic Sensitivity	Contaminant Inventory			
			IOC	VOC	SOC	Microbial
Well #1	2	1	5	5	5	2
<b>Final Susceptibility Scores/Ranking</b>						
	IOC	VOC	SOC	Microbial		
Well #1	4/Low	4/Low	4/Low	4/Low		

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

HIGH\* - Indicates source automatically scored as high susceptibility due to presence of bacteria or a VOC, SOC or an IOC above the maximum contaminant level in the tested drinking water.

## **Section 4. Options for Source Water Protection**

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

Cottonwood Point Water Association already has some significant drinking water protections in place. The well head is located inside a well house with a concrete floor that safeguards the well from surface contaminants. The system is well run and in substantial compliance with the *Idaho Rules for Public Drinking Water Systems*. Deficiencies noted during the last sanitary survey were repaired promptly. The system has developed an emergency response plan.

The sanitary survey mentioned that the well's production is not adequate. Even with water restrictions, the well is scarcely able to keep up with demand during some parts of the year. A second well was abandoned when it was shown to be drawing from the same source as Well #1. It is important to ensure that the second well was abandoned in accordance with Idaho Department of Water Resources standards since it can be a direct conduit into the ground water for surface contaminants. Cross connection control is important for the same reason: surface contaminants can be siphoned into the distribution system during periods of low pressure such as may occur during a power outage.

The association is actively looking for a new well site. Meanwhile, the system should continue to promote water conservation among the system users. A moratorium on new housing in the area may be necessary until a new water source is developed.

Due to the time involved with the movement of ground water, wellhead protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term.

## **Assistance**

Public water suppliers and users may call the following IDEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the IDEQ office for preliminary review and comments.

Coeur d'Alene Regional DEQ Office	(208) 769-1422
State IDEQ Office	(208) 373-0502
Website:	<a href="http://www.deq.state.id.us/water/water1.htm">www.deq.state.id.us/water/water1.htm</a>

Water suppliers serving fewer than 10,000 persons may contact Melinda Harper of the Idaho Rural Water Association (208) 343-7001 for assistance with drinking water protection strategies. [www.idahoruralwater.com](http://www.idahoruralwater.com)

## **References Cited**

Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 1997. "Recommended Standards for Water Works."

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Idaho Department of Water Resources, 1993. Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules. IDAPA 37.03.09.

Natural Resource Conservation Service, 1991. Idaho Snake-Payette Rivers Hydrologic Unit Plan of Work. March 1991.

United States Geological Survey, 1986. Quality of Ground Water in the Payette River Basin, Idaho. United States Geological Survey. Water Resources Investigation Report 86-4013.

University of Idaho. 1986. Ground Water Resources in a Portion of Payette County, Idaho. Idaho Water Resources Research Institute. University of Idaho. Moscow, Idaho. April 1986.

## Attachment A

### Cottonwood Point Water Association Susceptibility Analysis Worksheet

**Ground Water Susceptibility**Public Water System Name : **COTTONWOOD POINT WATER ASSN**Source: **WELL #1**Public Water System Number : **1050008**

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<b>1. System Construction</b>		<b>SCORE</b>			
Drill Date	6/74				
Driller Log Available	YES				
Sanitary Survey (if yes, indicate date of last survey)	YES 2002	2002			
Well meets IDWR construction standards	NO	1			
Wellhead and surface seal maintained	YES	0			
Casing and annular seal extend to low permeability unit	YES	0			
Highest production 100 feet below static water level	NO	1			
Well located outside the 100 year flood plain	YES	0			
<b>Total System Construction Score</b>		<b>2</b>			
<b>2. Hydrologic Sensitivity</b>					
Soils are poorly to moderately drained	YES	0			
Vadose zone composed of gravel, fractured rock or unknown	NO	0			
Depth to first water > 300 feet	NO	1			
Aquitard present with > 50 feet cumulative thickness	YES	0			
<b>Total Hydrologic Score</b>		<b>1</b>			
<b>3. Potential Contaminant / Land Use</b>		<b>IOC</b>	<b>VOC</b>	<b>SOC</b>	<b>Microbial</b>
Land Use	SUBURBAN	Score	Score	Score	Score
Farm chemical use high	NO	0	0	0	0
IOC, VOC, SOC, or Microbial sources in Sanitary Setback	NO	NO	NO	NO	NO
<b>Potential Contaminant Source/Land Use Score</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Potential Contaminant / Land Use - ZONE 1B ( 3 YR. TOT)</b>					
Contaminant sources present (Number of Sources)	HOUSING DEVELOPMENT	1	1	1	1
(Score = # Sources X 2 ) 8 Points Maximum		2	2	2	2
Sources of Class II or III leacheable contaminants or Microbials	YES	1	1	1	
4 Points Maximum		1	1	1	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0
<b>Total Potential Contaminant Source / Land Use Score - Zone 1B</b>		<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>
<b>Potential Contaminant / Land Use - ZONE II (6 YR. TOT)</b>					
Contaminant Sources Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or Microbials	NO	0	0	0	
Land Use Zone II	Less than 25% Agricultural Land	0	0	0	
<b>Potential Contaminant Source / Land Use Score - Zone II</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Potential Contaminant / Land Use - ZONE III (10 YR. TOT)</b>					
Contaminant Source Present	HIGHWAY	1	1	1	
Sources of Class II or III leacheable contaminants or Microbials	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of Zone	NO	0	0	0	
<b>Total Potential Contaminant Source / Land Use Score - Zone III</b>		<b>2</b>	<b>2</b>	<b>2</b>	<b>0</b>
<b>Cumulative Potential Contaminant / Land Use Score</b>		<b>5</b>	<b>5</b>	<b>5</b>	<b>2</b>
<b>4. Final Susceptibility Source Score</b>		<b>4</b>	<b>4</b>	<b>4</b>	<b>4</b>
<b>5. Final Well Susceptibility Ranking</b>		Low	Low	Low	Low



## POTENTIAL CONTAMINANT INVENTORY

### List of Acronyms and Definitions

**AST (Aboveground Storage Tanks)** – Sites with aboveground storage tanks.

**Business Mailing List** – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

**CERCLIS** – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ? Superfund? is designed to clean up hazardous waste sites that are on the national priority list (NPL).

**Cyanide Site** – DEQ permitted and known historical sites/facilities using cyanide.

**Dairy** – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

**Deep Injection Well** – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

**Enhanced Inventory** – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

**Floodplain** – This is a coverage of the 100year floodplains.

**Group 1 Sites** – These are sites that show elevated levels of contaminants and are not within the priority one areas.

**Inorganic Priority Area** – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

**Landfill** – Areas of open and closed municipal and non-municipal landfills.

**LUST (Leaking Underground Storage Tank)** – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

**Mines and Quarries** – Mines and quarries permitted through the Idaho Department of Lands.)

**Nitrate Priority Area** – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

**NPDES (National Pollutant Discharge Elimination System)** – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

**Organic Priority Areas** – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

**Recharge Point** – This includes active, proposed, and possible recharge sites on the Snake River Plain.

**RICRIS** – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

**SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities)** – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

**Toxic Release Inventory (TRI)** – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

**UST (Underground Storage Tank)** – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

**Wastewater Land Applications Sites** – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

**Wellheads** – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

**NOTE:** Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.